NORTHERN PIPELINES

Backgrounder

Yukon
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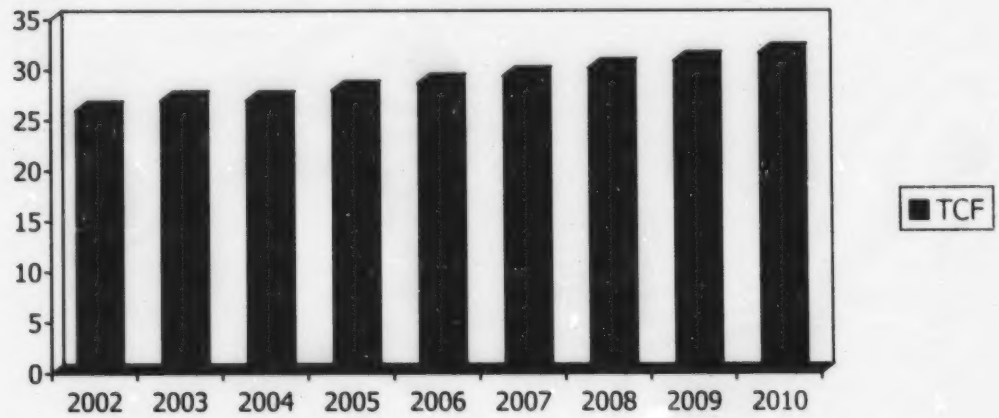
Introduction

Market conditions have rekindled interest in exploring, developing and commercialising the north's oil and gas resources. More specifically, it is the north's potential to produce significant amounts of natural gas that has once again captured the interest of exploration and development companies, pipeline companies, governments and consumers. Although it's difficult to predict how the September 2001 terrorist attacks in the United States or recent economic uncertainty may affect natural gas markets in the short term, most analysts agree that North American demand for natural gas will continue to grow.

Market Conditions

Renewed interest in northern natural gas development is the result of favourable market conditions created by rising demand and declining production from producing basins. In its 2002 Annual Energy Outlook which considers the events of 2001, the Energy Information Administration (EIA) in the United States forecasts U.S. consumption to increase at an annual average rate of 2%; from a total of 22.8 trillion cubic feet (TCF) this year to 33.8 TCF by 2020, largely due to rapid growth in demand for electrical generation.[1] U.S. power generation demand rose 11% in 2000 and this sector of the market will continue to grow, as most new power generation in the United States is gas fired. If the economy grows more rapidly, the EIA expects that total U.S. consumption could reach 35 TCF, while other analysts believe total consumption could even reach 50 TCF per year by 2020. Canadian demand is also expected to increase at an annual average rate of 2.5% reaching 3.7 TCF by 2010 and 4.7 TCF by 2020.[2] Total North American demand for natural gas in 2010 will exceed 31.7 TCF which will require additional supplies of 6 TCF per year, while total demand in 2020 could exceed 38 TCF.

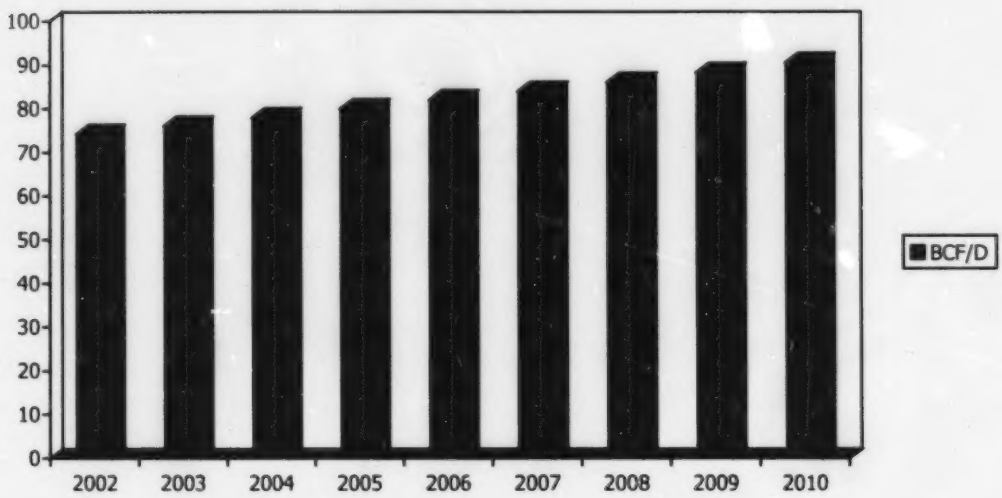
Figure 1- Annual Consumption (TCF)



[1] Annual Energy Outlook 2002, Energy Information Administration, Overview Page 4.

It's worth putting this forecast of demand for natural gas in perspective because it underlies northern pipeline proposals. The U.S. consumes more natural gas than it produces, demand is growing, and production from traditional regions is declining. The U.S. relies on Canada to help close the gap between production and consumption. In 2000, Canada exported approximately 3.5 TCF, or 10 billion cubic feet per day (BCF/D) to the U.S. The North American market will need approximately 17 BCF/D of new gas supply by 2010, while U.S. market growth alone through 2020 totals 11 TCF or approximately 30 BCF/D, a quantity of gas three times greater than the total of our current exports.

Figure 2 - Daily Consumption (BCF/D)



Natural gas prices are also expected to rise at an annual average rate of 1.6%, reaching $3.26 (constant dollars) per thousand cubic feet (MCF) or $5.56 (nominal dollars) in 2020. However, other analysts believe prices will rise faster as a result of growing demand and diminishing supply, such that the floor price believed necessary for sustainable arctic development, $3.00/MCF, will be achieved within two years.[3] If demand is stronger than anticipated, or if existing sources of supply decline more rapidly, or additions of new reserves are lower than expected, gas prices will escalate more rapidly, much as they did during 2000/2001. Although natural gas prices remain at historically high levels the natural gas market has self-corrected and the situation is much different today. Conservation, fuel switching, and a slower economy have decreased demand, storage levels are up, and production has increased. However, the events of 2000/2001 clearly

However, the events of 2000/2001 clearly signalled that the market needs more stable, secure and competitive sources of supply.

[2] Canadian Natural Gas, Market Review and Outlook, Natural Gas Division, Natural Resources Canada, May 2001 Page 31.

[3] The Imperatives of Arctic Natural Gas Development, Ronald Oligney and James Longbottom, November 2001.

signalled that the market needs more stable, secure and competitive sources of supply.

These conditions hold the potential to create a new northern natural gas industry that benefits Canada, and benefits northerners whether they live in Alaska, Yukon or the Northwest Territories.

Producers, pipeline companies, and gas distributors all acknowledge that the market needs gas not only from the North Slope of Alaska and the Canadian north but from other sources as well if supply is to keep pace with demand.[4] In a recent report, the U.S. National Petroleum Council painted this picture of the growing North American gas market: " by 2015 more than 14 million new customers will be connected to a natural gas supply through over 300,000 miles of new transmission pipelines and distribution mains. Many more customers will use electricity that is fuelled by natural gas as over 140 gigawatts of new electricity generation capacity – almost entirely gas burning units – go into service. These new customers as well as the existing customer base, are counting on long term availability of reliable, competitively priced natural gas to meet their energy needs ... Industry, government and other stakeholders must act quickly, cooperatively, and purposefully to meet those expectations." [5]

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Northern Gas Resources

There are presently three proposals for pipelines to move northern gas to market. They include a stand-alone Mackenzie Delta Project, the Alaska Highway Pipeline Project, and an offshore route that would combine Alaskan and Canadian gas in a pipeline trenched across the floor of the Beaufort Sea.

Market conditions and the demand for natural gas mean that northern natural gas projects like the Alaska Highway Pipeline Project and a stand-alone Mackenzie Delta Project are not mutually exclusive, but complementary. Northern natural gas development is not limited to one project. Taken together northern projects could never supply the 17 BCF/D of new gas supply North America will need by 2010, in fact it will take new discoveries, enhanced recovery from existing basins, and new or expanded transmission infrastructure to meet this demand. The U.S. National Petroleum Council estimates that an investment of some $1.5 trillion (US) will be required to develop these facilities through 2015.[6]

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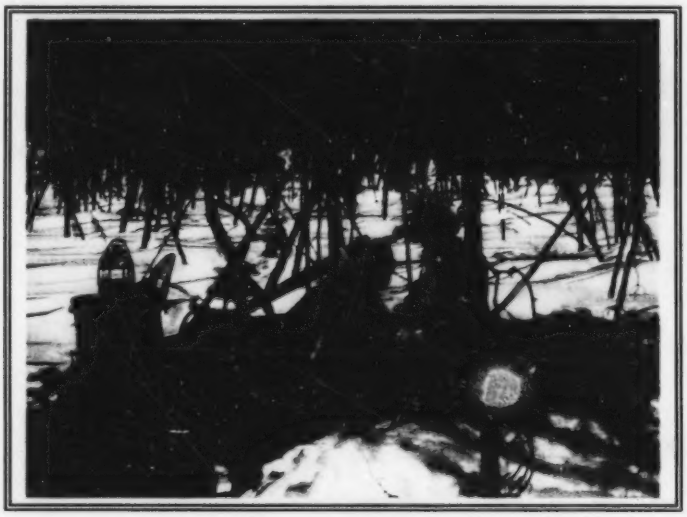
[4] When gas demand spiked in 2000, Canadian production rose 3.4%. Most of that gas came from the Sable offshore energy project, while production in Western Canada rose only 1.4%.

[5] National Petroleum Council. Natural Gas - Meeting the Challenges of the Nation's Growing Natural Gas Demand. Volume 1 Summary Report Page 23.

[6] National Petroleum Council. Natural Gas - Meeting the Challenges of the Nation's Growing Natural Gas Demand. Volume 1 Summary Report Page 16.

The Government of Yukon does not believe that the Yukon and the Northwest Territories are locked in competition for a single pipeline route. Northerners, Canadians, companies and consumers are not faced with an "either/or" decision.

Complementary projects, staged over time and guided by market conditions, are good for Canada, the north, and for consumers. These projects are separated only by questions of timing and economics. Reserves, preparedness for market, costs, engineering and environmental differences differentiate northern pipeline proposals.



HELIPORTABLE SEISMIC DRILLING
EAGLE PLAIN, 2001

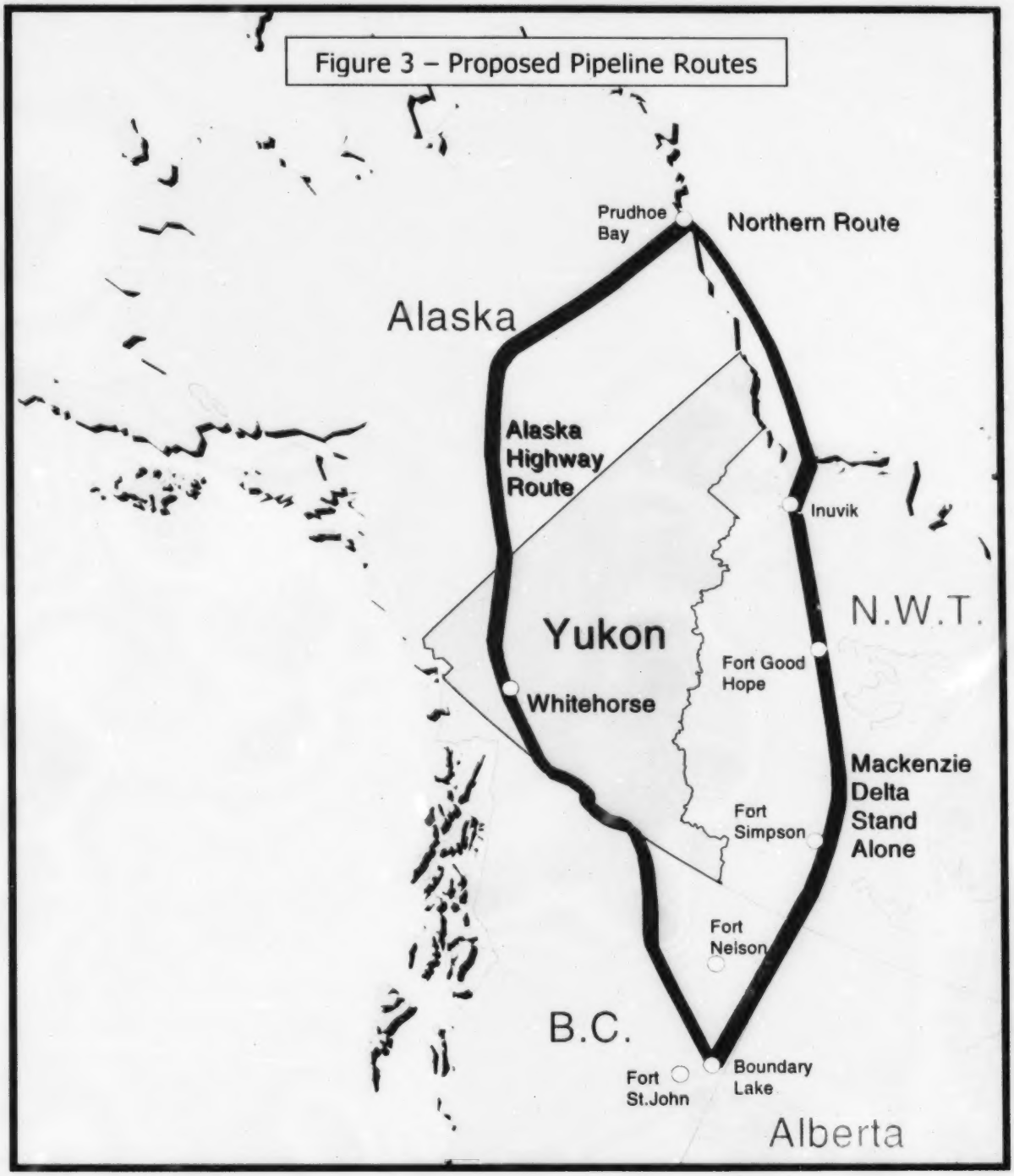


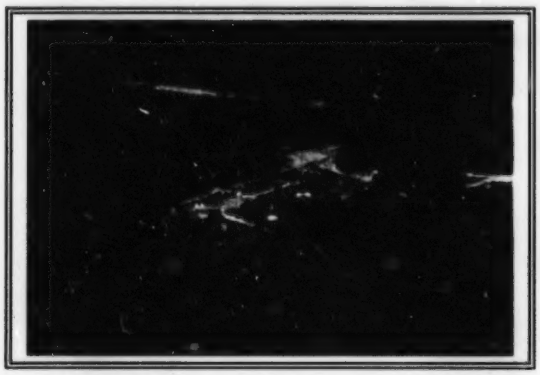
Figure 3 – Proposed Pipeline Routes
Prudhoe Bay
Northern Route
Alaska
Alaska Highway Route
Inuvik
N.W.T.
Yukon
Fort Good Hope
Whitehorse
Mackenzie Delta Stand Alone
Fort Simpson
Fort Nelson
B.C.
Fort St.John
Boundary Lake
Alberta

Northern Gas Resources and Project Comparisons

Reserves

The north holds vast reserves of natural gas. Proven reserves at Prudhoe Bay total approximately 35 TCF. The ultimate potential of the North Slope may be as high as 100 TCF. North Slope gas is plentiful, pipeline ready, and being produced daily. Approximately 8 BCF/D of gas is currently produced on the North Slope and most of that, about 6.5 BCF/D is re-injected into the reservoir. By comparison Canada consumes approximately 8 BCF/D.

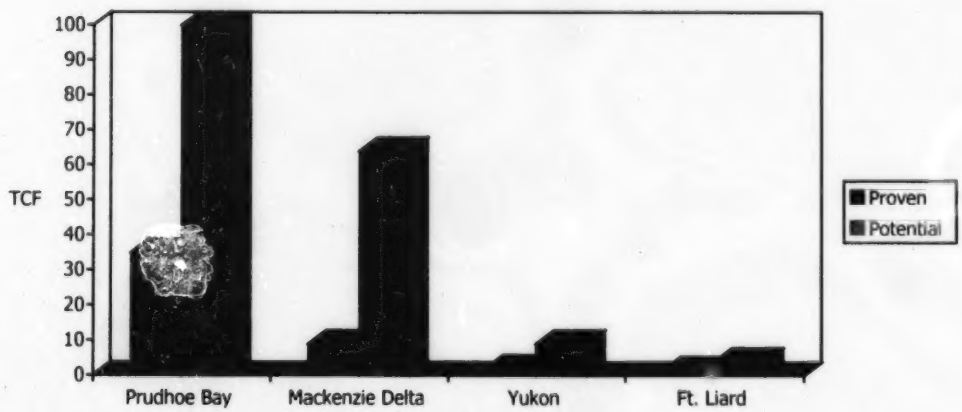
Proven reserves in the Mackenzie Delta total approximately 9 TCF, about one-third of the proven reserves at Prudhoe Bay. The ultimate potential of the Mackenzie Delta may be as high as 64 TCF. To date, proven reserves in the Fort Liard area total 1.5 TCF, and the potential for this region may be as high as 4 TCF. The potential of Yukon's eight sedimentary basins is largely unknown, as just 71 wells have been drilled in the Yukon. However, proven discoveries have been made in the Eagle Plain basin, and the territory exports natural gas today at the rate of 11 billion cubic feet per year (BCF), from two producing wells in southeast Yukon that rank among Canada's top producers. Yukon's discovered reserves total 2 TCF while potential reserves total 9 TCF.



KOTANEELEE GASFIELD, SOUTHEAST YUKON

In aggregate northern natural gas reserves total almost 200 TCF. Despite these massive volumes if northern gas resources were produced at a rate of 8 BCF per day (5 BCF from Alaska, 2 BCF from the Mackenzie Delta, and 1 BCF from other sources) it would satisfy less than half of North America's new daily need by 2010.

Figure 4 - Northern Gas Reserves



Timing Advantages

Prudhoe Bay and Mackenzie Delta natural gas reserves are differentiated by preparedness for market. Production infrastructure is already in place at Prudhoe Bay. Discovery wells drilled in the Mackenzie Delta during the 1970s were later abandoned. It will take several years to prepare the Mackenzie Delta for development including wells, gathering lines, and processing facilities. Some estimates suggest completion of this infrastructure could take up to three years and cost $1.5 billion.

The Alaska Highway Pipeline Project is not a "greenfield" project. The Federal Environmental Assessment and Review Office completed an environmental review in 1982, and the project met the environmental standards of the day. Although this information would need to be refreshed in terms of today's standards, it does provide the Alaska Highway Pipeline Project with significant timing advantages.

Mackenzie Delta Option

The cost of a Mackenzie Valley pipeline is often quoted at $3 billion US. However, this quote often fails to provide the context for this estimate. Mackenzie Delta producers, led by Imperial Oil, are currently examining the feasibility of commercialising Mackenzie Delta gas and recently announced a decision to proceed to the project definition stage.

These efforts are focused on construction of a smaller high-pressure pipeline delivering volumes of approximately 800 million cubic feet (MCF/D) to 1 billion cubic feet per day (BCF/D). This concept contemplates a stand-alone pipeline that would deliver gas from the Mackenzie Delta to a hub in Alberta. It does not contemplate a connection with Prudhoe Bay.[7]

Enbridge Inc., Trans Canada Pipelines Limited, and Westcoast Energy have examined similar proposals. These development concepts propose construction of either a 24-inch pipeline or a slightly larger 36-inch pipeline. Enbridge estimates the cost of the smaller pipeline at $3 billion, and the larger project at $4.2 billion.[8] If the cost of field development is added to these estimates, the cost of these projects rises to $4.5 billion and $5.7 billion respectively.

These concepts are also intended as viable stand-alone projects. A project connecting the Mackenzie Valley Project with Prudhoe Bay would require a much larger and more sophisticated project design. The assertion that a Mackenzie Valley project would be less expensive to construct than the Alaska Highway Pipeline Project holds true only if the Mackenzie Valley project does not include transmission of Prudhoe Bay gas.

Simply stated, a Mackenzie Valley project that delivers both Alaskan and Canadian gas could not be constructed for $3 billion.

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[7] Imperial Oil Limited Mackenzie Delta Producers Group and Mackenzie Valley Aboriginal Pipeline Corporation Advance to Project Definition Phase, News Release, Calgary, January 2002.
[8] For the North, From the North: Enbridge Perspective on a Mackenzie Valley Gas Pipeline, Ed Porter. Enbridge Inc. Presentation to Insight 2000, Second Annual Conference on Extending Oil and Gas Operations in Yukon and Northwest Territories, Calgary, September 21-22, 2000.

Off Shore

A proposal has been developed to transport Prudhoe Bay gas in a sub-sea pipeline to the Mackenzie Delta, where it would join Mackenzie Delta gas for shipment up the Mackenzie Valley.

The project would be capable of delivering large volumes of gas in the range of 4-5 BCF per day. It would require a very large high-pressure pipe or twin lines, and would test the limits of pipeline technology in a variety of sea and land based environments.

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This project faces numerous engineering, construction, operational, and financial risks. The environmental and regulatory review process could take as long as five years with no guarantee the project would be approved. It would require lengthy reviews and multiple approvals. Potential showstoppers include significant construction and operational obstacles such as ice and strudel scour; deep trenching; lack of soil stability in the sea-bed; short and unpredictable construction seasons; coastal erosion and storm surge; and seabed seismicity. Permitting this project would be difficult, if not impossible. It may also require the U.S. and Canada to settle a long-standing border dispute in the Beaufort Sea. According to most estimates the project would cost at least $10 billion (US).

An offshore project would also have to overcome what may be impossible barriers related to political and public acceptability. The State of Alaska has already enacted legislation prohibiting any permitting for an offshore project until a southern route has been constructed and environmental groups such as the U.S. based Natural Resource Defence Council have vowed to aggressively intervene against it.

Alaska Highway Pipeline Project

The Alaska Highway Pipeline Project was awarded Certificates of Public Convenience and Necessity by the *Northern Pipeline Act* in Canada and by the *Alaska Natural Gas Transportation Act* in the United States. Southern portions of the project, called the prebuild, were constructed in parts of Alberta, British Columbia and Saskatchewan in the 1980s. Construction of the northern portion of the pipeline will complete the project.

Current proposals call for the construction of a pipeline from Prudhoe Bay to Fairbanks along the Trans Alaska Pipeline System (TAPS) right of way, and then from Fairbanks along the Alaska Highway right of way to Boundary Lake, Alberta. The project would deliver between 2.5 BCF and 4.0 BCF of gas per day and cost between $7.6 and $9.7 billion respectively.

The Alaska Highway Pipeline Project is the subject of an existing Canada/U.S. treaty and the project sponsor, Foothills Pipe Lines Limited, maintains an easement for the project through Yukon and parts of Alaska. The approvals granted for the Alaska Highway

project remain valid today and have been used on several occasions in recent years to upgrade or expand the Foothills system. For example, the permits were employed and the Northern Pipeline Agency approved and regulated the Foothills/Northern Border expansion in 1998.

In December 2000 Alaska's three major oil and gas producers agreed to a joint work program on an Alaska Gas Pipeline Project under the auspices of the Alaska Gas Producers Pipeline Team (AGPPT). The team includes Phillips Petroleum, ExxonMobil, and BP. Key activities include conceptual design, project costing, permitting considerations, commercial structures, and overall viability. This work is drawing to a close, and while the Alaska Gas Producers Pipeline Team has not yet identified a commercially viable project (from a producer's perspective), work continues aimed at reducing costs and associated risk.[9] The AGPPT has concluded that based on work to date, a northern or offshore route would cost $15.1 billion, while a southern route would cost $17.2 billion.[10]

The potential for completing the Alaska Highway Pipeline Project took an enormous step forward late last year when a Memorandum of Understanding (MOU) was signed between several major American energy firms and three Canadian firms. The MOU committed the companies to proceed with the development of a detailed proposal and commercial arrangements for shipping Alaskan gas to market, and established key principles for reconstituting a project Sponsor Group.

The U.S. companies include subsidiaries of Williams Cos., Duke Energy, Sempra Energy International, PG&E Corporation, and El Paso Corporation. The three Canadian companies include TransCanada PipeLines, Westcoast Energy and Foothills Pipe Lines. Together these firms enjoy the knowledge, capacity and risk tolerance to complete the project. Discussion between the sponsor group and producers was initiated in January 2002.

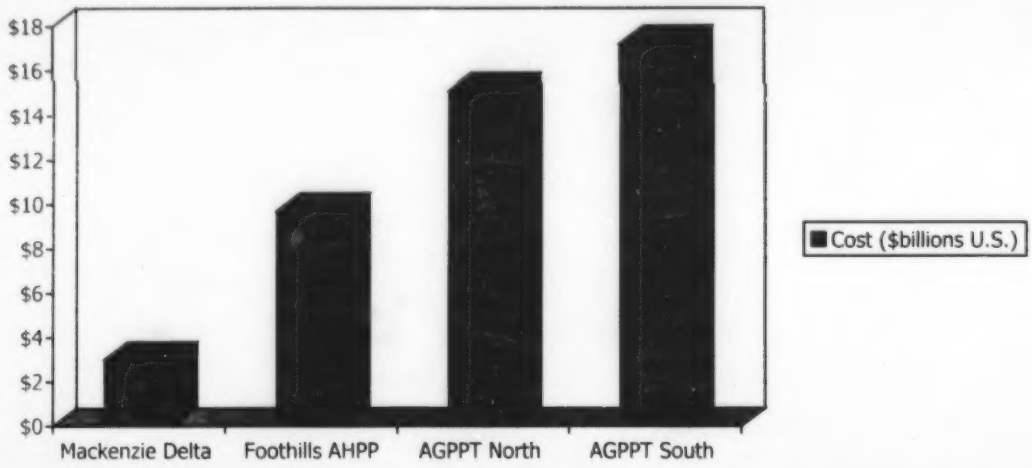
Table 1 – Project Comparisons

	Length	Diameter	Throughput	From/To	Cost
AGPPT South	2139 miles	48-52"	4-6 BCD/D	Alaska to Lower 48	$17.2 billion
Foothills AHPP	1753 miles	42"	2.5-4.0 BCF/D	Alaska to Alberta	$7.6 billion - $9.7 billion
AGPPT North	1803 miles	48-52"	4-6 BCF/D	Alaska to Lower 48	$15.1 billion
Mackenzie Delta stand-alone	1100 miles	30"	800 MCF – 1.0 BCF/D	Mackenzie Delta to Alberta	$3 billion + lifting cost

[9] The AGPPT has not been able to identify a commercially viable project capable of supporting a 15% rate of return.

[10] All dollars are U.S. Significant differences in cost estimates arise related to project design, for example both the northern and southern options examined by the AGPPT contemplate new pipeline construction from Alaska to Alberta (A-B), and from Alberta to Lower 48 markets (B-C). Foothills proposes new pipe only from Alaska to Alberta where northern gas would enter existing or upgraded pipeline systems.

Figure 4 - Cost Comparisons



Yukon Government Position

The Government of Yukon believes that the Alaska Highway Pipeline Project and a stand-alone Mackenzie Delta project will be constructed. It also believes that the Alaska Highway Pipeline Project will be constructed first for several reasons. Regulatory approvals are already in place. Half of the right of way has been secured. The project has been found to be environmentally acceptable. It uses an existing transportation corridor offering the least environmental impact. The project is also the subject of an existing international agreement. It is fully competitive with any alternative and enjoys wide spread support in Alaska. The Governor of Alaska and the Alaska Legislature have also selected an Alaska Highway Pipeline route as Alaska's choice for commercialising North Slope natural gas. The project also enjoys the financial and business support of many major energy companies in both Canada and the United States.

The Government of Yukon believes that the Alaska Highway Pipeline Project and a stand-alone Mackenzie Delta Project will be constructed.

Resource development in sensitive environmental areas brings with it complex environmental issues. The Government of Yukon will not support any proposal to connect the Alaska North Slope to the Mackenzie Delta that requires construction of petroleum infrastructure in highly sensitive ecosystems and produces few benefits for Yukon. The National Energy Board and other agencies have previously rejected similar proposals because of unacceptable environmental risk. Despite advances in technology, these risks remain unacceptable today.

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A northern route is politically and environmentally unacceptable, pushes the limits of technology, and invites acrimonious legal proceedings that would delay or foreclose the opportunity to develop northern gas. It will never enjoy the public, political, or investor support needed for success.

Yukon maintains that in the long run the market will support two northern pipelines, one from Alaska, and another smaller project originating in the Mackenzie Delta. Yukon supports Mackenzie Delta development and wishes that development every success. Yukon believes the first priority of all stakeholders must be to gain a foothold for northern gas in the North American gas market. Northern pipeline projects are threatened more by market volatility and competing sources of supply rather than the order in which these projects might proceed. The fortunes of Alaska, Yukon and Northwest Territories are tied where gas development is concerned, but not because northern gas needs to share a common pipeline. The risk of stranded gas doesn't lie in the question of pipeline routes. Rather it lies in the risk that North American gas consumers will turn their back on the potential for northern gas in favour of other energy alternatives.

The Alaska Highway Pipeline Project was the right choice for commercialising North Slope gas twenty-five years ago, and it's the right choice today. Even net of its certificates, the Alaska Highway Pipeline Project is still the best project because it can be constructed using existing technology, has been extensively reviewed, and it relies on existing infrastructure and transportation corridors.

Canada's Role

In a landmark presentation by a federal Associate Deputy Minister of Indian Affairs and Northern Development[11], Canada recognised that the market will drive northern energy development and that commercial interests will be a key factor in pipeline routing.

The federal government acknowledged that interest in the north's resources are based on expectations of commercial viability and that the development of these resources in the Mackenzie Delta, on the Alaskan North Slope, and other regions will be determined on economic grounds.

The federal government affirmed that its role is to provide the regulatory and fiscal certainty needed by industry to make investment decisions. Canada also affirmed that it would meet its obligations where the Canada/U.S. agreement and other approvals are concerned for the Alaska Highway Pipeline Project.[11]

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[11] The Process Ahead for Moving Gas South, Remarks by Dennis Wallace, Associate Deputy Minister, Indian Affairs and Northern Development, Government of Canada. Ziff Energy Conference, Calgary, October 17, 2000.

Yukon agrees that the role of governments where these projects are concerned is that of a regulator, and appreciates Canada's desire to maintain route neutrality. However, the federal government must not only appear route neutral, it must also behave in a route neutral manner. The federal government owes the Alaska Highway Pipeline Project the same regulatory clarity it is working to provide in the Northwest Territories. It can do that by clarifying the status of the certificates issued for the AHPP in 1978, and by reconstituting the Northern Pipeline Agency.

Federal financial support for economic development is needed across the North and not just in one jurisdiction. It should be provided in an equitable and comprehensive manner in the form of a Northern Economic Development Strategy, and not by providing financial assistance to one territory over another.

Benefits for Canada

The Government of Yukon does not accept the argument that one project is better for Canada than another.

The Alaska Highway Pipeline Project will produce immense benefits for Yukon, the Northwest Territories, and the rest of Canada. This project will create substantial jobs, economic opportunities, and revenues for Yukon, Alberta, British Columbia, Ontario, the Northwest Territories and other parts of the country. The Alaska Highway Pipeline Project will deliver similar benefits for the Yukon and Canada, as the Mackenzie Delta Project will produce for the Northwest Territories and Canada. The suggestion that the Alaska Highway Pipeline Project is about Canadian gas versus American gas fails to recognise the competitiveness of a deregulated North American market or that this project will pave the way for exploration and development of Yukon's eight sedimentary basins.

The Government of Yukon does not believe that the Alaska Highway Pipeline Project will shut in Mackenzie Delta gas. The North American gas market can easily absorb the staged introduction of gas from both Alaska and the Canadian north.

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Canadian producers with a significant stake in the north agree there are enough resources, and enough opportunities, to support more than one project.[12] Together these projects will deliver immense benefits to Canada.

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[12] Natural gas pipeline route to be decided within the year, Calgary Herald, October 17, 2000. See also Energy bosses say north Canada gas can stand alone, Reuters, October 16, 2000.

According to a study completed by Informetrica for the federal departments of Industry, Finance, Natural Resources and Indian and Northern Affairs, these two projects would deliver the following economic benefits to Canada NOT including infrastructure expansion in southern Canada:

1. 281,000 person years of employment (144,000 from the AHPP, 137,000 from Mackenzie).
2. Increases in provincial GDP for Alberta 2.4%, for British Columbia 3.2%, Saskatchewan 5.7%, and rest of Canada 0.4%.
3. GDP growth of 3.3% for Canada's energy sector.
4. National GDP growth of 1.8% from Mackenzie, 1.2% from the Alaska Highway Pipeline Project for total national GDP growth of 3.0%.
5. National labour income growth of 2.3%.

A more recent study by Informetrica prepared for the Government of Yukon reports the following economic benefits for Canada, Yukon and the North just from an Alaska Highway Pipeline Project:

1. 108,000 person years of employment including 31,000 for British Columbia, 21,000 for Central Canada, and 32,000 for the North which in fact means additional jobs for southern Canadians. If government recycles project benefits in the economy these figures rise to 377,000 nationally; 67,000 for British Columbia; 50,000 for the North and 165,000 for Central Canada.
2. $26 billion in GDP for Canada including $17 billion for British Columbia and Yukon. Where benefits are recycled National GDP rises to $31.4 billion, and GDP for British Columbia and Yukon reaches $12 billion.
3. Real business investment totalling $10.3 billion, $7.2 billion in British Columbia and Yukon, $1.8 billion in the Prairies, and $1.2 billion in Central Canada. In the second instance these figures rise to $11.8 billion nationally, $8 billion for British Columbia and Yukon, $1.7 billion for the Prairies and $2 billion for Central Canada.

Aboriginal Land Claims

Unresolved land claims present equal challenges for both Yukon and Northwest Territories. The proposed Alaska Highway Pipeline will travel through the traditional territories of several Yukon First Nations, including First Nations who are in the process of finalising their Land Claim and Self Government Agreements.

Land Claim and Self Government Agreements that have been completed protect the pipeline route, and address related issues such as access, infrastructure, gravel resources, and taxation. Future agreements are expected to include these types of provisions. Outstanding claims are all at an advanced stage of negotiation, and the Yukon government has committed to working toward the completion of outstanding land claims and has taken positive steps to develop strong and effective working relationships with First Nations.

Unresolved land claims present equal challenges for both Yukon and the Northwest Territories.

The Yukon government believes that the Alaska Highway Pipeline Project should benefit all Yukon people. In that regard, the Yukon government continues to support the development of partnerships between First Nations and industry to share in opportunities that will result from the proposed Alaska Highway Pipeline Project. In January of this year the Government of Yukon joined with Canada and the Council of Yukon First Nations (CYFN) to fund preparation of a First Nation Oil and Gas Preparedness Plan. The plan will help ensure Yukon First Nations benefit from Yukon's emerging oil and gas industry including exploration and development and pipeline planning.

Yukon is committed to continuing its work with First Nations to finalise outstanding Land Claim agreements and create a network of effective working relationships.

Summary

The Alaska Highway Pipeline Project was the right choice for North Slope gas twenty years ago and it is the right choice today. It will be constructed first because it can meet the needs of the market sooner. It has received approval in principal and other permits. It follows an existing transportation corridor, has the support of Alaska, and is fully competitive with other options in terms of unit tolls and benefits for Canada.

As with any new infrastructure development of this magnitude, there are always environmental considerations. The Government of Yukon is committed to ensuring that this project creates opportunities for Yukon people and is undertaken in a way that protects the environment.

The Alaska Highway Pipeline Project will not shut in other Canadian resources, but will pave the way for development of a new northern natural gas industry. The Alaska Highway and Mackenzie Valley pipeline projects are not competitors. Nor do they compete with other Canadian energy projects. They are but two elements of a continental energy mix that will require an investment of $1.5 trillion in the next two decades. They are complementary projects representing significant investment opportunities for Canada that should be welcomed and supported.